**Proposal for Strategic Investment Fund 2017**

**Improving the prioritization framework in Livestock CRP**

Issue and Objective:

A priority-setting tool, previously developed for the assessment of ILRI’s research, was adapted for the development of the CRP Livestock proposal (McCleod, 2016). However, a number of identified weaknesses limit the capacity of this tool to contribute to a wider scope of *ex-ante* impact assessments. An activity is proposed to construct a prioritization framework based on improved analytical models and data availability. This exercise will enhance the capacity of the CRP Livestock to prioritize research investments. In particular, the framework will contribute data, tools and methods to guide the evolution of the program’s research portfolio, improving its alignment to universal goals of poverty reduction, food and nutrition security, and enhanced management of natural resources. Amongst other outcomes, a better-aligned portfolio of the CRP Livestock will contribute to generating research outputs aimed at: development and deployment of improved agronomic and animal husbandry practices, reduction of market barriers, provision of improved livelihood opportunities, and improved access to healthier diets for poor and vulnerable populations.

This exercise responds directly to experiences made earlier with the prioritization tool, which revealed the model to be most sensitive to assumptions made about the potential for success. Consequently, the analytical framework will incorporate more explicitly quantifiable measures of the factors that translate innovations into impact, and will thus contribute to the generation of more credible estimates for CRP outcome targets. Planned activities and outputs are outlined for 2017, with indications of what follow-up work can be done given additional funding in 2018.

Activities:

* Using secondary and (minimal, strategic) primary data, expert consultations, and variations of livestock systems modeling (e.g., DynMod), generate new data and conduct **quick** updates of existing databases (e.g., IMPACT) related to:
  + Potential gains to livestock productivity from improved animal nutrition, health, genetic/breeding technologies, and expected trends on these. Models such as Lesnoff’s DynMod herd model (Lesnoff, 2008) are useful for translating information on potential changes in livestock herd productivity to parameters that can be used in economic analysis. This data will be useful for determining potential economic impacts of the improvement-enhancing technologies and will be distinguished by agro ecological conditions/management/market conditions.
  + Updated characterization and mapping of livestock keepers, herd sizes, depth of poverty, and youth involvement in agriculture to improve current prioritization.
  + Development of new impact domains for technology adoption based on existing data including the new characterization (above). These will inform the estimation of the reach of research and development impacts.
  + Assessment of linkages between livestock ownership and nutrition to define potential impacts of intensification on public health and nutrition.
* Incorporate the data and models into an analytical framework (e.g., Briones et al., 2004) simulatingthe **innovation-to-impact pathway** of the CRP Livestock. The new analytical framework (see Figure 1) will quantify multi-dimensional impacts of innovations, and will cover different nodes or stages of the pathway and near- to long-term horizons. This will be essential to credibly estimate the potential for successful outcomes and impacts. The framework will be adapted to the CRP’s Theory of Change (ToC), making it applicable to both target-setting at the CRP planning stages, and to tracking progress through the implementation stage. This will include identifying interventions suitable for ex-post impact assessments. A test-case application of the framework will be conducted for two or more selected countries:
  + Impacts of candidate research portfolios on socio-economic outcomes such as agricultural incomes, food availability, hunger and malnutrition, poverty and employment will be measured using the IMPACT model (Robinson et al., 2015) and GDP growth elasticities (Anyanwu, 2013)(Kaspos, 2005). Such quantitative models that represent the global food system, are particularly useful for ensuring objectivity in scoring where trade-offs exist between various impacts.
  + Environmental impacts (water only) will be computed for 2 case study areas: The peri-urban intensification in Bama (Burkina Faso) and the sheep value chain in Atsbi (Ethiopia) based on country-specific parametrization of the CLEANED model (Pfeifer, Morris, & Lannerstad, 2016).

In 2018:

* + Adapt the CLEANED model to allow linkages with IMPACT for quick environmental assessments of IMPACT scenarios on technological, economic, and climate change.
  + Extend the analysis of environmental impacts to other locations, and to cover other dimensions of impacts such as land use, soil, and greenhouse gas emissions.
  + Update priority scores assigned to candidate research activities within the CRP Livestock portfolio using the **revised data** and adaptations of available **quantitative simulation models**.

Outputs:

* Critical review of the current prioritization within the CRP Livestock.
* Updated methods and input data for ex-ante impact assessments to inform prioritization decisions within the CRP Livestock.
* Database of results of impact assessments that are useful to Livestock CRP and CGIAR managers, and, possibly, to the wider community of researchers, donors, and policy makers.

Integrated assessment tools: DynMod, IMPACT, CLEANED, GDP growth elasticities

Conceptual framework for impact pathway analysis (e.g., Briones) using Livestock CRP TOC

McCleod – Randolph – Thornton Framework\*

Results on economic returns to investments, environmental impacts, etc.

Quick data collection on livestock productivity, potential beneficiaries, etc.

Updated framework (data, methods, results) on impact assessments

Literature reviews and expert consultations

Figure 1: Schematic of key activities and outputs.

\*Prioritization tool in McCleod (2016) builds on Randolph et al., (2001), Thornton et al., (2000).

Geographical scope

The databases and analytical models will be developed mainly for the CRP Livestock target countries. However, the final set of integrated will be generic and can be adapted for assessing research priorities in other countries. Guidelines will be provided on how to update the data and models for new contexts.

Table 1: Timeline of Activities and Outputs

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Activities | **Outputs** | **Deliverable Format** | Jul-Aug 2017 | Sep – Oct 2017 | Nov-Dec 2017 | 2018 |
| A1 | Review of prioritization framework; agreed tools, methods, and data for improvement | Review | X |  |  |  |
| A2 | Develop new analytical framework | Analytical framework | X | X |  |  |
| A3 | Data collection on socio-economic, and environmental impacts | Database\* |  | X | X | X |
| A4 | Herd (DynMod), Economic (IMPACT, GLOBE), Environmental (CLEANED) models applied to new framework | Adapted models/model results |  | X |  | X |
| A5 | Outputs useful for refining Livestock CRP prioritization and impact targets | Report on synthesized outputs from phase I data and tools |  | X | X |  |
| A6 | Refined Livestock CRP prioritization and impact targets | Extended report on outputs from phase I and II data and tools |  |  |  | X |

\*\*Databases can be made available on ILRI online portal in 2018.

Table 2: Contributors, roles and person months **in 2017**:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Contributor** | **Expertise-related Tasks** | **A 1** | **A/O 2** | **A/O 3** | **A/O 4** | **A/O 5** | **Estimated % FTE** |
| Steve Staal (ILRI) | Guidance on policy and impact analysis, application to research prioritization | X | X |  | X | X | 0% |
| Dolapo Enahoro (ILRI) | Analytical framework development, global economic modeling, IMPACT model linkages for integrated assessments: Dynmod (2017), CLEANED (2018) | X | X | X | X | X | 20% |
| Catherine Pfeifer (ILRI) | Spatial analysis, household data, Environmental impact data and model application: case study on environmental impacts (2017); linkages of IMPACT to CLEANED (2018) | X | X | X | X | X | 10% |
| Aymen Frija (ICARDA) | Assessment of poverty alleviation and employment generation impacts of different R&D interventions for selected countries | X |  | X | X |  | 8% |
| Nils Teufel | Farming systems modelling, monitoring and evaluation | X | X |  |  |  | 4% |
| An Notenbaert (CIAT) | Spatial analysis, environmental impacts |  | X |  |  |  | 4% |

Table3: Contributions of specific deliverables

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Center** | **Contributor** | **Initial Review/Analytical Framework** | **Quantitative Models** | **Data** | **Reports** |
| ILRI | Dolapo Enahoro | Review of TOC and analytical models for Livestock CRP prioritization | Analytical framework for prioritization, IMPACT and Herd model linkages and simulations | Input data for IMPACT; IMPACT model outputs on agricultural incomes and food security | Collated report on outputs from analytical framework and models |
| Catherine Pfeifer | Assessment of innovation adoption/ impact domains of CRP research streams (1-2 pages) | Case study of environmental impacts (2017); linkage of CLEANED to IMPACT (2018) | Data and maps of impact domains for selected CRP research streams and countries | Data and maps for final synthesis |
| Nils Teufel | Review of TOC, links to M&E and Livestock CRP prioritization |  |  | Feedback |
| ICARDA | Aymen Frija | Overview of appropriate methodologies for the assessment of the effect of different R&D interventions on poverty alleviation and employment generation in developing countries (1-2 pages) | Provide estimates of poverty and employment effects of selected R&D investment scenarios using a combination of Total Factor Productivity (TFP)/ IMPACT approach | Primary assessment of the effect of R&D interventions on TFP; IMPACT model estimates; secondary data on poverty and employment elasticities for selected countries/regions (various sources) | Feedback |
| CIAT | An Notenbaert |  |  | Data and maps of impact domains for (selected) CRP research streams and countries | Feedback |

Budget (USD)

See annex.

Primary Experts to contact:

* Mark van Wijk (Livestock Systems, ILRI)
* Karl Rich (Systems Dynamics, ILRI)
* Daniel Mason D’Croz (IMPACT Model, IFPRI/PIM FP1)

References

Anyanwu, J. (2013). Determining the correlates of poverty for inclusive growth in Africa. *African Development Bank, Working Paper Series 181*.

Briones, R., Dey, M. M., Ahmed, M., Stobutzki, I., Prein, M., & Acosta, B. O. (2004). Impact pathway analysis for research planning : The case of aquatic resources research in the WorldFish Center. *NAGA, WorldFish Center Quarterly*, *27*(3 & 4), 51–55.

Kaspos, S. (2005). Employment intensity of growth: trends and macroeconomic determinants. *International Labor Organization, Employment Strategy Papers.*

Lesnoff, M. (2008). DynMod: A tool for demographic projections of tropical livestock populations under Microsoft Excel, User’s manual - Version 1. *CIRAD (French Agricultural Research Centre for International Development); ILRI (International Livestock Research Institute)*, 29 pp.

McCleod, R. (n.d.). Unpublished Second Draft of Exante Impact Assessment of the proposed Livestock Agri-Foods Systems research program of the CGIAR. *Livestock CRP, ILRI Nairobi*.

Pfeifer, C., Morris, J., & Lannerstad, M. 2016. (2016). *The CLEANED R simulation tool to assess the environmental impacts of livestock production* (No. 18). Nairobi, KENYA.

Randolph, T. F., Kristjanson, P. M., Omamo, S. W., Odero, A. N., Thornton, P. K., Reid, R. S., … Ryan, J. G. (2001). A framework for priority setting in international livestock research. *Research Evaluation*, *10*(3), 142–160.

Robinson, S., Mason d’Croz, D., Islam, S., Sulser, T. B., Robertson, R. D., Zhu, T., … Rosegrant, M. W. (2015). *The International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT): Model description for version 3. IFPRI Discussion Paper 01483* (No. 1483). Washington, DC.

Thornton, P. K., Randolph, T. F., Kristjanson, P. M., Omamo, S. W., Odero, A. N., & Ryan, J. G. (2000). Priority assessment for the lnternational Livestock Research Institute, 2000-201O. *Impact Assessment Series No. 6. ILRI, Nairobi*.

**Annex: Budget**

Note: Budget figures for Year 2 (2018) are indicative and dependent on subsequent and separate approval.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Budget Items Details** | | | **Amount (USD)** | | | | | | | | |
|  |  |  | **ILRI** | | **ICARDA** | | **CIAT** | | **Subtotals** | | **TOTAL** |
| **Contributor** | **% staff time** | **Global Cost** | **Year 1** | **Year 2** | **Year 1** | **Year 2** | **Year 1** | **Year 2** | **Year 1** | **Year 2** |
| Dolapo Enahoro | 20% | 115,500 | 23,100 | 24,255 |  |  |  |  | 23,100 | 24,255 | **47,355** |
| Catherine Pfeifer | 10% | 104,900 | 10,490 | 11,015 |  |  |  |  | 10,490 | 11,015 | **21,505** |
| Nils Teufel | 5% | 192,600 | 9,630 | 10,112 |  |  |  |  | 9,630 | 10,112 | **19,742** |
| ICARDA | 8% | 200,676 |  |  | 16,723 | 17,559 |  |  | 16,723 | 17,559 | **34,282** |
| CIAT | 4% | 212,708 |  |  |  |  | 8,508 | 8,934 | 8,508 | 8,934 | **17,442** |
| ILRI Research coordination |  |  | 6,483 | 6,807 | - | - | - | - | 6,483 | 6,807 | **13,290** |
| ILRI Space costs |  |  | 473 | 473 | - | - | - | - | 473 | 473 | **946** |
| ILRI ICT costs |  |  | 1,220 | 1,220 | - | - | - | - | 1,220 | 1,220 | **2,440** |
| Surveys |  |  |  | 10,000 |  |  |  |  | - | 10,000 | **10,000** |
| Expert consultants |  |  | 4,000 | - |  |  |  |  | 4,000 | - | **4,000** |
| Operational travel |  |  | 5,000 | 5,000 |  |  |  |  | 5,000 | 5,000 | **10,000** |
| **Total Direct Costs** |  |  | **60,396** | **68,881** | **16,723** | **17,559** | **8,508** | **8,934** | **85,627** | **95,374** | **181,001** |
| Indirect Costs |  |  | 10,267 | 11,710 | 2,559 | 2,687 | 936 | 983 | 14,557 | 16,214 | **30,770** |
| **GRAND TOTAL** |  |  | **70,663** | **80,591** | **19,282** | **20,246** | **9,444** | **9,916** | **100,184** | **111,588** | **211,771** |